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WebQuests: Can They Be Used to Improve Critical Thinking Skills in Students?

ABSTRACT. The WebQuest, an inquiry-oriented, Web-based classroom-learning tool, invented by Dodge (1997), is discussed in terms of its applicability to classroom learning situations. Specifically discussed is its ability to inspire critical thinking in students. The WebQuest format, as defined by Dodge (1997), is compared to a critical thinking framework established by Weinstein (2000). It appears that WebQuests meet all six of Weinstein's key elements in critical thinking and therefore are powerful tools for inspiring critical thinking skills in students. Further research is recommended to affirm this notion. [Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <getinfo@haworthpressinc.com> Website: <<http://www.HaworthPress.com>> © 2002 by The Haworth Press, Inc. All rights reserved.]

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New technologies are continuing to transform society. Fax machines, e-mail, the Internet, cell phones, video conferencing, digital cameras, and a host of other technological innovations make it possible to transmit information in a matter of seconds. These new technologies present many challenges, and suggest a number of questions that go beyond their undeniable, short-term usefulness. A critical question for educators is whether increased access to information can facilitate efforts to develop critical thinking skills in students (Postman, 1993).

Currently, there is much discussion about how to successfully integrate technology into the classroom (Alessi & Trollip, 2001; Bitter & Pierson, 1999; Geisert & Futrell, 2000; Jonassen, 2000). There are many benefits to integrating technology into educational environments. New technologies, computers specifically, can teach ideas and concepts in exciting, enjoyable, and efficient ways (Alessi & Trollip, 2001; Bitter & Pierson, 1999; Geisert & Futrell, 2000; Jonassen, 2000). However, bringing computers into classrooms is expensive, both financially and in terms of the time and effort required. Therefore, it is essential that computers contribute to the achievement of important, rather than trivial educational goals. If computers can be used to help develop critical thinking skills, few would argue that the money, time, energy, or enthusiasm required for implementation has been wasted.

One means that may contribute to the accomplishment of this goal is the use of a Web-based, inquiry-oriented activity called a WebQuest. This article will discuss WebQuest theory and practice, investigate existing literature on critical thinking theory and practice, and project how WebQuests may promote critical thinking skills in students. The first section will address the underlying theoretical premise of WebQuests, describe WebQuest structure, and describe how WebQuests are currently being used in educational settings. The second section will discuss critical thinking theory, practice, and research. The third section will discuss how WebQuests can inspire critical thinking in students. The fourth section will address criticisms of WebQuests. Overall, this paper will investigate WebQuests as one way educators can integrate technology into their classrooms to promote students' critical thinking skills.

WEBQUESTS

The WebQuest concept was developed in 1995 by Dr. Bernie Dodge and his student at the time, Tom March, at San Diego State University

for the purpose of helping teachers integrate technology into their classrooms. Dodge defines a WebQuest as “an inquiry-oriented activity in which some or all of the information that learners interact with comes from resources on the Internet, optionally supplemented with video-conferencing” (Dodge, 1997, p. 1). Simply put, a WebQuest is a teacher-constructed, Web-based lesson.

There are two types of WebQuests, short-term and long-term. Short-term WebQuests take between one and three days to complete and generally introduce new ideas to students. Long-term WebQuests take longer than three days to complete and generally build on students’ existing knowledge. WebQuests include five major components. First, an introduction sets the stage for the learning experience. It may set a realistic scenario for students to act out or give background on a topic to be explored. The introduction section is intended to whet student interests. Second, the task section is clearly described. The task may present a set of questions for students to answer or it could describe the project students are expected to complete. This section describes the finished product the instructor expects the students to create. Next, the process section is a step-by-step description of how to accomplish the task. Additionally, advice on how students may organize their finished products is included in this section. Links to sources that describe specific skills necessary to complete the project may be included in the process section as well (e.g., how to interview, how to brainstorm). Then, the resource section lists links to Internet resources that students may use to accomplish the task. Explanations of the links are also included so that students know which sites they are going to visit on the Web. The resource section may also include resources not located on the Internet. For instance, in the *Anthem: A Utopian Society* WebQuest (Good, 2000), no Internet resources are needed. Students use Ayn Rand’s book, *Anthem* (1953), to accomplish the task. Fifth, the evaluation and conclusion section outlines evaluation criteria. Generally, teachers post evaluation matrices so that students are aware of what is expected of them before they begin working. This section also gives closure to the WebQuest. Credits, references, and links to outside sources for further investigation might be listed in the evaluation and conclusion section (Dodge, 1999).

WebQuests have many advantages as teaching tools. One strength is that they narrow and direct students’ Web searches. Searching the Web through the use of search engines and directories can generate an overwhelming amount of information that may or may not include the information being sought, even when students practice good search techniques.

By conducting the preliminary Web searches themselves, and then placing all of the necessary resources to complete the task within the WebQuest, educators simplify the Web-browsing process and direct students' Internet experiences so that students have greatly improved chances of completing the tasks presented to them. Therefore, WebQuests challenge student intellectual and academic ability rather than Web searching skills. However, students still use basic Web-browsing skills to successfully complete most WebQuests, and thereby further develop their computer skills (Summerville, 2000).

Since teachers create WebQuests for their students and provide the links to Web sites that students are to visit, WebQuests promote a child-safe Internet environment. Although it is still possible for students to wander into inappropriate sites, this is less likely to occur if the choice of site is not left completely open (Yoder, 1999). Therefore, the WebQuest is an excellent form of Web-based instruction for teachers who are looking to streamline their students' Web browsing and increase safety on the Internet.

WebQuests can also provide students with a multitude of perspectives. As Mathison and Pohan (1999) write, "[M]aterial found on the Internet is often more current, raw in nature, . . . and unpublished, and thus not otherwise readily available" (p. 53). This can be appreciated in light of the fact that the Web makes it possible, with just a few mouse clicks, for students to search the Library of Congress catalog, read the American Constitution, visit the Holocaust Museum, watch the first lunar landing, and listen to songs popular during World War I—all in the space of only a few minutes. The ease of access and the wide variety of information available give educators a unique opportunity to inspire students to explore different perspectives, places, ideologies, and the world as a whole. WebQuests are structured, organized, time-efficient tools used by educators to make available to students a wide array of relevant Internet information that can inspire critical thinking skills.

CRITICAL THINKING

Critical thinking has been defined and studied in many ways by many people. One of the foremost theorists and practitioners, Richard Paul (1995), defines critical thinking as:

- (1) Disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking.

- (2) Thinking that displays mastery of intellectual skills and abilities. (3) The art of thinking about your thinking while you are thinking in order to make your thinking better: more clear, more accurate, or more defensible. (p. 526)

Another well-known critical thinking expert, Robert Ennis (1987), defines critical thinking as “a practical reflective activity that has reasonable belief or action as its goal” (p. 10). Others define it as “the systematic evaluation of the arguments of others” (Browne, Freeman, & Williamson, 2000, p. 391). While there is some variation among these definitions, a common thread linking them is that critical thinking is an introspective approach to understanding one’s own thoughts and ideas from an alternative perspective.

This concept is not new to education and dates back to Socrates who asked probing questions in an effort to force his students to reconsider the underlying assumptions behind their far-reaching statements. In the 20th century, Edward Glaser and Goodwin Watson were the first to develop an assessment tool to test critical thinking skills. Originally developed in 1941, it has been revised several times and is still commonly used today (Watson & Glaser, 1980). More recent efforts to infuse educational systems with critical thinking goals have been led by such reformers as John Dewey, Edward Glaser, Max Black, Robert Ennis, Robert Sternberg, Matthew Lipman, and Richard Paul (Paul, 1995).

The literature on critical thinking is extensive. In fact, Jeris Cassel and Robert Congleton’s 1993 *Critical Thinking: An Annotated Bibliography* catalogs critical thinking literature published between 1980 and 1991. Their book is some 400 pages long and contains references to 930 different pieces of critical thinking literature.

As might be expected, there are many different ideas about what comprises critical thinking and how to encourage its development. One common theme, however, is that many experts suggest that those who would foster critical thinking should “encourage exposure, recognition, and acceptance of multiple viewpoints by individuals and encourage providing opportunities for individuals to use critical thinking” (Cassel & Congleton, 1993, p. viii).

A critical question related to critical thinking is whether critical thinking skills are amenable to improvement. Of the critical thinking studies conducted over the past decade, a large number have been conducted with nursing students. Given the nature of the nursing profession, where life-affecting decisions are made on a daily basis, many nursing education program educators seek ways to model or teach

critical thinking skills to their students. Then too, the National League for Nursing Accrediting Commission insists on critical thinking assessment of enrolled nursing students as a condition of accreditation (Howenstein, Bilodeau, & Brogna, 1996).

Many studies of nursing programs have examined students' pre- and post-nursing education critical thinking abilities to help determine if students are receiving proper educational experiences. One such study examined 172 nursing students' pre- and posttest scores on the Watson Glaser Critical Thinking Appraisal (WGCTA). Students received direct instruction on critical thinking skills during the course of their program. Results revealed that students' critical thinking skills did not increase over their five years of study. However, they did reveal that the WGCTA scores correlated with students' grade-point averages. This may indicate that students who have good critical thinking skills are more likely to earn higher grades. Another interesting finding of this study is that older students tended to perform better on the WGCTA and also in their academic programs (Behrens, 1996).

Howenstein, Bilodeau, and Brogna (1996) studied in-service nurses. Interestingly, in contrast to Behrens' (1996) findings, this study showed that nurses with higher levels of education performed better on the WGCTA. Furthermore, results revealed that older nurses performed less well on the WGCTA than younger nurses. This may suggest that older nurses do not perform better on the test simply by virtue of being older. This also may clarify Behrens' (1996) results and suggests that there is something inherent to nursing instruction that leads to better performance on the WGCTA to which younger people are simply more responsive.

Another study compared WGCTA scores between nursing students enrolled in an accelerated program and students in the traditional four-year program at the same university. Students received direct instruction on critical thinking skills during the course of their program. Results revealed that students in the accelerated program performed better than the traditional students initially on the WGCTA, but both groups performed similarly upon graduation from the program. Also, pre- and posttest scores were only different (higher) for the traditional students. Since students from both groups were tested at the same time, students from the accelerated group had taken more classes at the time of pretesting than the traditional group. These results, combined with those of Behrens (1996) and Howenstein et al. (1996), may suggest that critical thinking abilities increase as years of nursing education increase (Pepa, Brown, & Alverson, 1997).

Angel, Duffey, and Belyea (2000) found that neither age nor possession of a previous non-nursing degree influenced critical thinking scores on the WGCTA for nursing students at a southeastern university in the United States. Although students did not receive direct teaching of critical thinking skills, their scores on the WGCTA increased from the beginning of their program until the time they graduated. This may suggest that there is something inherent in nursing education that promotes critical thinking in students.

Another study from outside of the nursing field compared WGCTA scores between African-American and Caucasian American college students at a southwestern state university. Results showed that Caucasian American students obtained higher scores than African-American students. The researchers suggest that African-American students may require "assistance in developing critical thinking skills" (Gadzella, Masten, & Huang, 1999, p. 539). No mention is made of the potential cultural bias of the measure.

The WGCTA has been criticized by some authorities (Adams, Stover, & Whitlow, 1999; Vaughan-Wrobel, O'Sullivan, & Smith, 1997). Morrison and Walsh (2001), through analysis of existing critical thinking theory and research, suggest ways that educators may create their own multiple-choice measures for critical thinking. However, the WGCTA seems to continue as the most popular measure for critical thinking, perhaps partly because of its ease of administration and scoring.

One study used qualitative measures to assess critical thinking skills in subjects. Temple (2000) looked at findings from the Reading and Writing for Critical Thinking Project that sent North American educators to central European and Asian countries to teach educators in those countries how to teach critical thinking skills to their students. Results revealed that students of the newly educated teachers began to "take more risks in learning and communicating, assume more responsibility for learning in the classroom, and appeared to feel more comfortable using creative and higher order thinking" (p. 313). In addition, teachers began to "examine their lessons for opportunities to promote critical thinking, allow students more opportunities to work alone and in groups, to ask more open ended questions, and to wait longer for students' responses" (p. 314).

A review of this critical thinking literature reveals some tendencies about critical thinking. First, the direct teaching of critical thinking skills may improve student ability to think critically (Behrens, 1996; Pepa, Brown, & Alverson, 1997), and the methods used to teach critical thinking appear to be successful in raising scores on the WGCTA. How-

ever, explicit details of the methods used in these studies are not always made clear. This shortcoming makes it difficult to determine which critical thinking teaching methods work and which do not. Second, research hints that critical thinking skills may be fostered simply through being allowed and encouraged to think critically in class. If such is the case, direct teaching of critical thinking skills may not be necessary (Angel et al., 2000). Third, age does not seem to have a bearing on one's potential to think critically (Angel et al., 2000). Fourth, there may be something specific about nursing education that may enhance critical thinking skills in students (Behrens, 1996; Howenstein et al., 1996; Pepa et al., 1997). Fifth, the WGCTA may not be the best measure for critical thinking skills because it may be biased against minority students (Gadzella et al., 1999). Also, it may not even test critical thinking skills at all, and it may be possible for educators to create their own critical thinking assessment tools that may work better than the existing standardized tests (Vaughan-Wrobel et al., 1997; Adams et al., 1999).

It is the second inference, that students can grasp critical thinking skills through indirect teaching methods, that has the most bearing on the WebQuest's ability to inspire critical thinking in students. While some WebQuests may attempt to directly teach critical thinking, most do not. How might WebQuests act to indirectly stimulate critical thinking?

WEBQUEST AND CRITICAL THINKING

WebQuests provide students with an opportunity to put critical thinking skills to use. Mark Weinstein of the Institute for Critical Thinking at Montclair State University in New Jersey presents a framework for critical thinking that he adapted from a definition suggested by his colleague, Matthew Lipman. Lipman defines critical thinking as "skillful, responsible thinking, that facilitates good judgment because it (a) relies on criteria, (b) is self-correcting, and (c) is sensitive to context" (Weinstein, 2000, p. 41). Weinstein then proceeds to detail a framework of critical thinking comprised of six components. The remainder of this section will use Weinstein's (2000) critical thinking framework to illustrate how WebQuests can and do foster critical thinking skills in students.

1. The requirement that critical thinking be skillful thinking connects it with norms of good practice. Skillfulness means critical thinking is embedded in contexts that furnish reliable informa-

tion and warranted methodology. Critical thinking is not indifferent to the norms developed over time in various fields; rather it looks to appropriate practice from the standards that have proved useful so far in supporting warranted inquiry of all sorts and for the most reliable information from which inquiry draws its relevance and strength. (Weinstein, 2000, p. 41)

The Web contains both information and misinformation. Anyone with limited resources and skills can post a Web page, and very little of the information on the Web has undergone any type of peer review before it was published. Dale (2000) compared three different Web sites' reports of the number of deaths resulting from the war in Kosovo, and found three widely different numbers. He goes on to explain how he used this as a lesson to teach his students to closely examine information obtained from the Internet. He had his students visit a Web site addressing the importance of critically reviewing information obtained from the Internet and then held a class discussion on the issue. This is an example of how the Internet can be used to teach critical thinking to students. He could have taken the lesson even further by having his students e-mail the sites' Webmasters with questions about the information they learned through their investigation and discussions.

Since teachers identify the Web sites that students are to visit in the course of a WebQuest, they are able to review and filter the sites to which their students are exposed. Hence, students' encounters with misinformation and "con-text" on the Internet become less of a problem than when students make use of search engines and directories, or when they surf the Web without guidance or direction. Therefore, WebQuests not only furnish students with reliable sources from which to enhance critical thinking skills, they also offer students and teachers a measure of protection from straying into inappropriate places on the Internet.

2. Responsible thinking points to the relationship between the critical thinker and the community that he or she addresses. The critical thinker sees an obligation to present reasons in light of acceptable standards or to challenge such standards by relevant and persuasive argument. Such reasons are subject to the judgment of competent members of fields relevant to the issues involved, and critical thinking is obliged to address such members and reflect upon their judgments when making claims and presenting arguments and analyses. (Weinstein, 2000, p. 41)

Primary sources are an essential ingredient to quality WebQuests. For instance, in the Let There Be Equity WebQuest, Dr. Neva Kelly (2000) directs her students to federal, state, and local laws posted on the Web to illustrate gender equity issues to her students. In Pam Petty's (2000) Patriotic Themes in Country Music WebQuest, students listen to country music songs while reading their lyrics and looking for themes in the music that may indicate our societal and cultural values. Linda Norton and Sherrie Thomas's WebQuest (Unknown), The Tinman WebQuest, directs students to Web sites where they may obtain information on community service opportunities in their local areas. Students must complete community service work in order to obtain credit for the lesson. These are examples of using the Internet to provide students with primary sources to form the basis from which they may "reason . . . or challenge . . . standards by relevant and persuasive argument" (Weinstein, p. 41). In other words, WebQuests can expose students to primary sources; thus enabling students to form their own ideas about the information presented, rather than relying on others (for instance, textbook authors) to interpret this information for them.

3. Through the focus of judgment, critical thinking is directed toward nonroutine thinking, thinking that cannot be adequately based on algorithms or other mechanical procedures. It is called for in situations in which considerations must be weighted and alternatives assessed, situations that call for the assessment of priorities and determinations of truth and relevance. (Weinstein, 2000, p. 41)

WebQuests are not linearly designed lessons. The very nature of the Internet and Hypertext goes against the rules of linearity. While visiting a resource site, students may decide to click on a link that will take them to another site that can enhance their understanding of the topic. Yet, WebQuests offer students structure so they do not flounder about in cyberspace without any direction. WebQuests offer students a balance between structure and freedom so that they may act autonomously to pursue their individual interests within the boundaries of the WebQuest.

In addition, WebQuests are often interdisciplinary (Dodge, 1997). As a result, educators drive their students to think about issues in complex, nonlinear, multifaceted ways. This can add depth to the topic and to the critical thinking process while at the same time creating a more realistic learning environment within the classroom. The world outside of school is rarely one-dimensional, and it may be beneficial for stu-

dents to have some experience with the complexities of adult life within the safety of the school learning context. WebQuests often provide opportunities to do just that.

4. Criteria are the most decisive considerations appealed to in an instance of critical thinking. Criteria are those reasons that reflect the critical thinker's assessment of the essential factors to be taken into account when offering an analysis or when supporting and challenging a claim. . . . A critical thinker, thus, is called upon to make the framework of her argument clear and to make the considerations she takes as crucial to the particular inquiry available to her audience. Generally, the applied criteria reflect the central concepts and methods in the field or fields relevant to the inquiry at hand, but criteria are not taken as absolute—they may be questioned, changed, or even replaced as critical thinking progresses. (Weinstein, 2000, p. 41)

The concept of “criteria” is central to Weinstein’s critical thinking framework. By criteria, Weinstein means the structures in place (societal, cultural, educational, legal, individual, or otherwise) that organize society. He lists several examples of criteria: standards, laws, canons, principles, assumptions, norms, goals, tests, credentials, experimental findings, conventions, and procedures.

Through exposure to primary sources, students can form their own opinions on important issues. Rather than relying on the opinions and filtering tactics of textbook writers, WebQuests encourage students to form their own opinions. Furthermore, since they are acting autonomously within the boundaries of the WebQuest, students are likely to retain this information because they have some control over the information to which they are exposed and, presumably, are interested in this information (Gee, 1990; Sankaran, Sankaran, & Bui, 2000; Smith & McNelis, 1993). Consequently, students may then have the understanding and skills to critically evaluate criteria.

5. Self-correction requires that thinkers use critical thinking processes as a method for exposing and correcting the procedures they employ. A critical thinker subjects the ongoing process to reflective scrutiny; both the substantive criteria employed and the procedural norms that characterize her reasoning are open to critique and re-evaluation. (Weinstein, 2000, p. 41)

WebQuests often present issues from a variety of perspectives, thus allowing students to base their thoughts on a variety of viewpoints. The Web is filled with sites with opposing viewpoints, and educators can easily include these viewpoints within their WebQuests. This, in turn, allows students to engage in a reflective learning process. In addition, WebQuests are often done cooperatively and, therefore, students engage in important critical reflection with their peers during the process of completing the quest. Moreover, WebQuests always have some kind of finished product that must be turned in to the teacher and, thus, students receive critical and reflective feedback from the teacher. As a result, WebQuests subject students to constant self, peer, and teacher review that may, in turn, assist students in the critical thinking process.

6. Sensitivity to context complements the appeal to general criteria, and demands that the application of criteria is scrutinized for appropriateness and possible modification in each particular case. The critical thinker thus sees criteria in relation to the context of their application, determines the relevance or plausibility of the criteria employed, and considers specific alterations to the criteria based on these factors. (Weinstein, 2000, p. 42)

WebQuests have the ability to contextualize learning in a way that was not available to learners before the Internet entered the classroom. A well-constructed WebQuest can introduce a variety of contexts and viewpoints to students in a variety of ways. WebQuests encourage students to consider other contexts by placing students into different contexts via the Web. In so doing, WebQuests invites students to think about how they might think, feel, or live as they might in different contexts.

For instance, in the Walk a Mile in Their Shoes WebQuest, students pick a country and learn about its history, geography, clothing, games, holidays, and other aspects of the country's culture. Then, students write a story about their lives as natives of that country, thereby driving the students to place themselves within the context of that country, but also allowing them to meaningfully connect it to life in their own country (Stuart, 1999).

In another WebQuest, Yervas y Remedios, students are asked to divide into teams of four with each member playing a role as either an ethnographer, a botanist, an ethnobotanist, or a curator. Each student is then invited to place him/herself into that role by asking the questions a person in that role would ask to determine the medicinal properties of

certain herbs. In addition, this WebQuest is available in both English and Spanish versions, thereby providing meaningful learning contexts for readers of both Spanish and English (Gonzales & Lujan-Pincomb, Unknown).

By encouraging students to think as they might in other contexts, WebQuests encourage students to recognize the impact that context has on criteria. Though fieldtrips are perhaps the best way to place students into new contexts, it is impossible to place them into every context that is necessary for truly understanding the world in which they live. While books and classroom discussion can place criteria into context, the non-linear nature of the Web can place students into several contexts in less time with just a few clicks of a button. Web resources do not accomplish the hands-on contextualization that a good fieldtrip will. However, WebQuests can appeal to many senses in ways that were not possible in traditional, noncomputerized classrooms (Alessi & Trollip, 2001).

SOME CRITICISMS OF WEBQUESTS

WebQuests are interesting, and potentially powerful Internet tools that may help promote critical thinking skills. However, they are not perfect, and can be criticized on many grounds. One problem is that they have become the latest educational fad. This may be partly due to the seductive nature of the term. "WebQuest" has an appealing sound and look that reminds us of "high tech" concepts and applications. This may have contributed to the fact that they are being promoted by some advocates as a panacea for all manner of educational ills. Because they are currently in fashion, such promotions find a ready acceptance among many educators, some of whom seem to believe that "the only WebQuest is a good WebQuest." This is nonsense, of course, and the Web abounds with both excellent and pathetically poor WebQuests of all kinds. What needs to happen at this point is that attention needs to be devoted to developing criteria for excellent WebQuests, rather than continuing to sing uncritical praises of WebQuests as if all were equally high in quality.

One major problem with many WebQuests is that they do not take the developmental nature of cognition into consideration. Many WebQuests are written in exactly the same way, whether intended for use by first-graders or by University students. This flies in the face of the work of developmental psychologists from Piaget to Kagan, as well as the experience of teachers from coast to coast. The idea that first-graders should

be taught in exactly the same way as seniors in high school would be laughed out of any teachers' lounge in the country.

A related problem has to do with the topics chosen for WebQuests. It would seem reasonable that the topics should be those included in the curricula of students at the level for which the WebQuest is written. Yet, many WebQuests seem unrelated to the curricular content of the targeted grade level (when grade level is specified), and topics sometimes seem to have been chosen arbitrarily. It is possible that some of the authors of these WebQuests believe that topic choice is irrelevant, and that critical thinking skills are generic in nature. However, this ignores the considerable body of research on problem-solving skills that seems to indicate that such skills are domain-specific. If there is any truth to this idea, topic choice is critical, and not to be taken lightly.

Another difficulty is that most WebQuests seem to embody the assumption that critical thinking skills can only be taught through group activity and consensus building. While these are important skills, it is also true that not everyone likes group work or does his/her best work in such settings. Yet, WebQuests seem, in general, to make little allowance for individual differences of any kind, much less differences in learning styles or learning preferences.

CONCLUSION

WebQuests are powerful, Web-based, instructional tools. The previous sections discussed WebQuests and critical thinking theory and research. Additionally, existing literature on WebQuests was compared to Weinstein's (2000) critical thinking framework to determine if WebQuests have the capacity to inspire critical thinking in students. The existing literature indicates that WebQuests might be useful in this regard. However, there is no existing literature that discusses this expressly. This is an area that could be explored in further research.

It appears that WebQuests have the ability to contribute to the Web becoming a meaningful, thought-filled, structured, and safe learning environment. Educators who are skeptical about the usefulness of computers in the classroom might consider WebQuests as a way to integrate computer technology into their classrooms. WebQuests structure Internet exploration to make it easier for students to stay on task and away from inappropriate Web sites. Furthermore, they provoke students to think critically about the world.

While WebQuests are interesting and useful, they are not without shortcomings. They have become an educational fad and are promoted uncritically by many advocates. Many WebQuests ignore what is known about the developmental nature of learning and the kinds of thought available to children at different developmental stages. Topics sometimes seem arbitrarily chosen and inappropriate for targeted ages or grade levels. Many WebQuests seem to be based on the assumption that all critical thinking instruction should involve group, rather than individual activities. In fact, many WebQuests seem to make no provision for individual differences of any kind—either those across grade and age levels or those within given, targeted classrooms.

A major barrier to the production of excellent WebQuests is the inability of many educators to author their own Web pages. Even though there are templates on the Web to offer some assistance to educators wishing to create WebQuests, educators still need to understand basic fundamentals of Web page construction to produce a useful WebQuest.

There are several options for educators who wish to create WebQuests but do not have experience authoring Web pages. First, most communities have institutions that offer classes on the use of one or more of the available Web editors. Teachers may enroll in one of these classes to learn how to use a Web publishing editor. However, if this is not an option for teachers, another possible solution is to have a student create the page. It is not uncommon for educators to have classes with students who are familiar with Web page design and authoring. This could be an excellent learning experience for students that may, in fact, provoke them to use their critical thinking skills.

The Web is an excellent learning tool that is often misunderstood and misused. There is an abundance of inviting, student-friendly information available on the Web. Teachers wishing to incorporate the Web into their instruction have many options for doing so. The WebQuest is one format of Web-based learning that teachers may wish to incorporate into their instruction because it provides students structure and safety. It also appears that WebQuests may be useful in the quest to find ways to develop or enhance critical thinking skills in students.

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